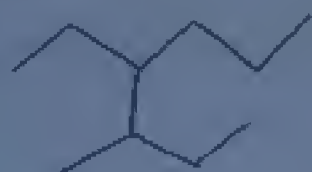


### T.D n°1

I- Déterminez la chaîne principale et les ramifications des molécules ci-dessous et nommez-les.

a-



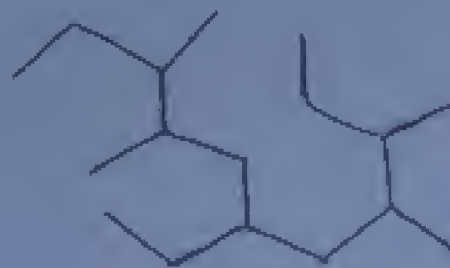
b-



c-



d-



II- Ecrivez une formule simplifiée contenant :

- a- Une chaîne principale de 7C avec deux ramifications de deux carbones chacune.
- b- Une chaîne principale de 8 carbones avec une ramification méthyle et une ramification isopropyle.
- c- Une chaîne principale de 6 carbones avec deux ramifications-éthyles et une ramification tbu.

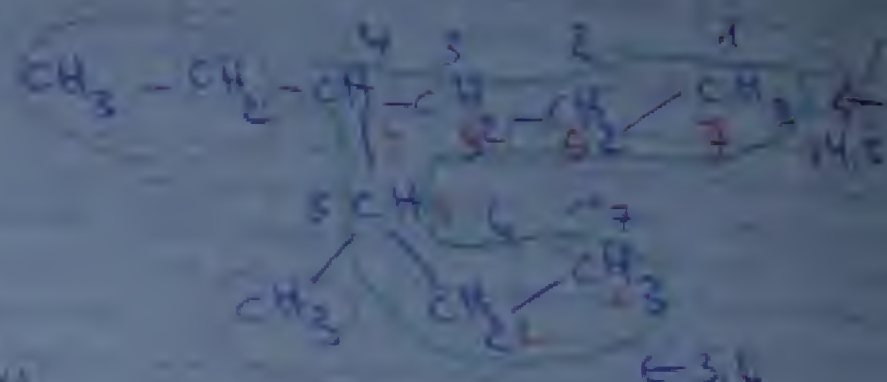
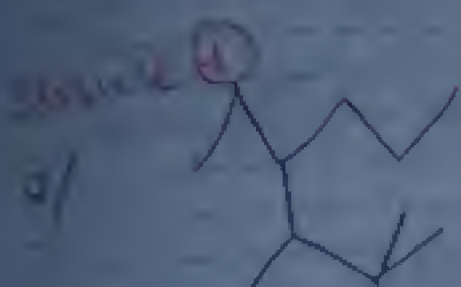
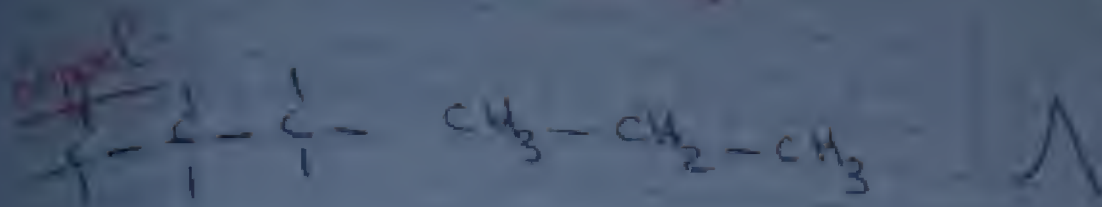
III- Dessinez en formule topologique (zig-zag) les structures associées aux noms suivants selon les règles de l'IUPAC :

- a- 4-isopropyl-3-méthylheptane.
- b- 3,7-diéthyl-5-isopropyldécane.
- c- 2,3,5-triméthylheptane.



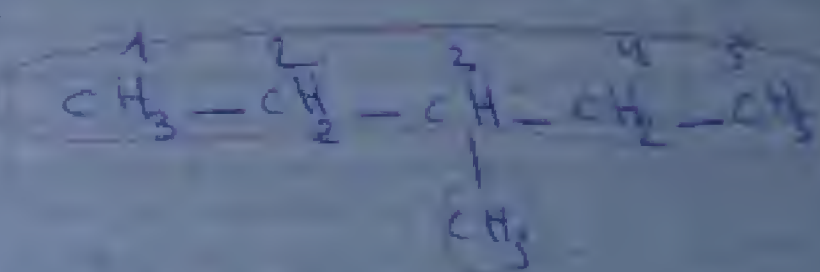


Ex 1.2 (3)



prefix | C.P | suffix

4-ethyl-3-methylheptane

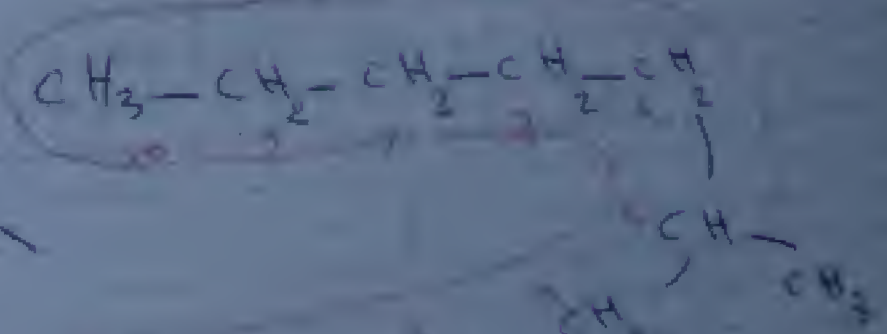
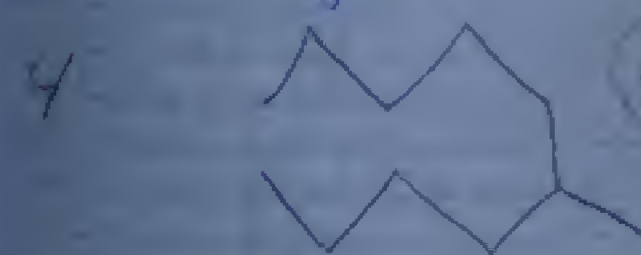


6 → hex

3 → methyl

ane

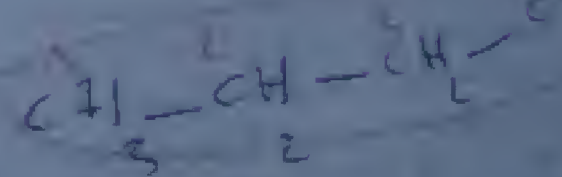
3-methylhexane



10 → dec

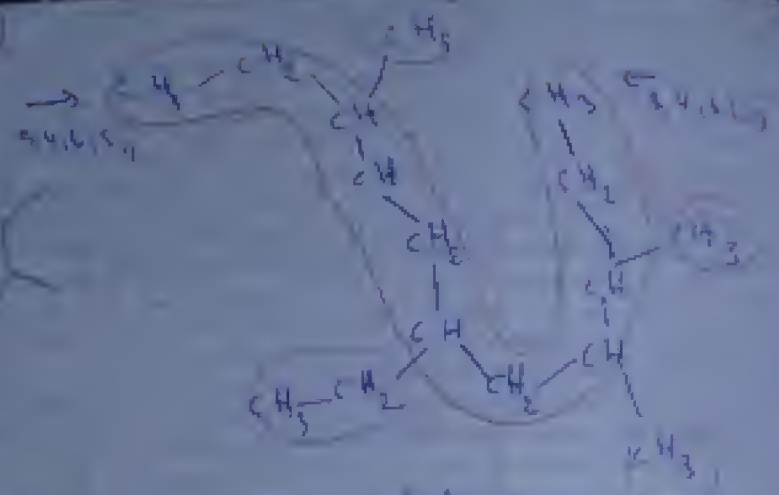
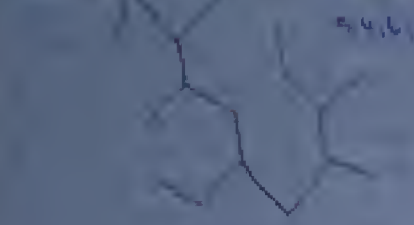
5 → methyl

ane



5-methyldecane

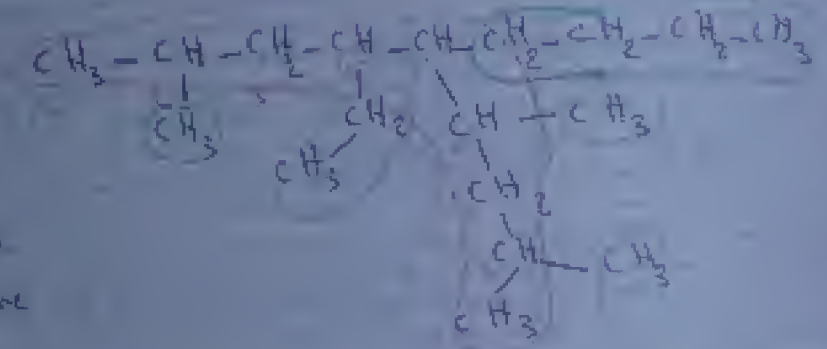
Exercice 1



10C → decane  
C.S. → ac

- 3 - M
- 4 - M
- 6 - E
- 8 - M
- 10 - M

E-ethyl-3,4,8,10-tetraméthyle undécane



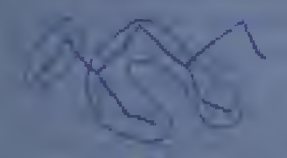
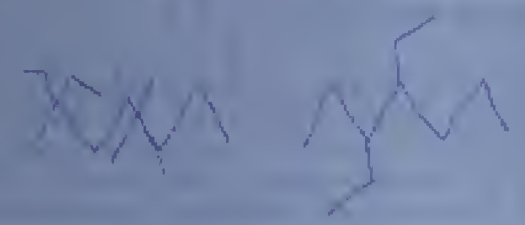
2, 4, 6, 8

- 9C → nonane
- D.S. → ac
- 1 - E
- 4 - E
- 5 - but
- 10 - M
- 12 - M

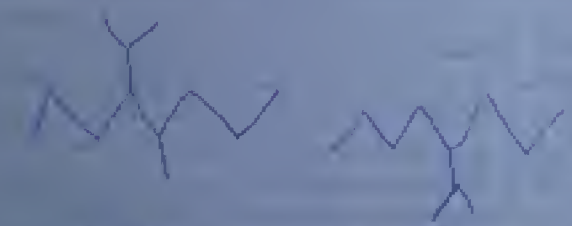
5-butyl-4-éthyle-2,6,8,10-tetraméthylnonane

Exercice 2

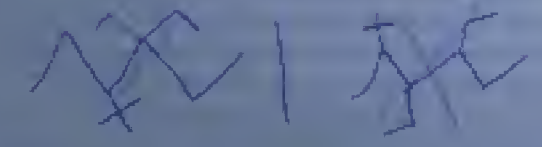
7C → { 2C  
2C



8C → { 3C  
3C

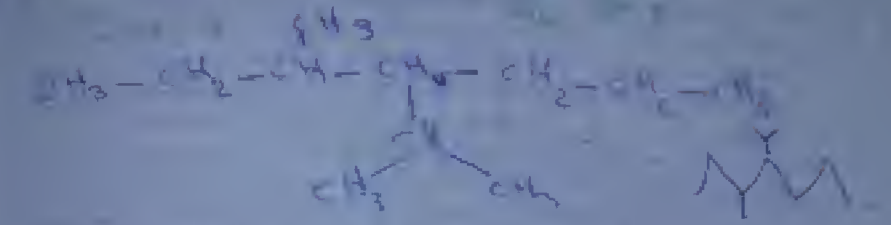


6C → { E  
E  
tBu

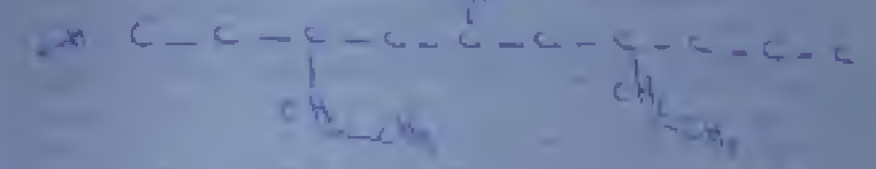


Exercice 3

1. isopropyl-3-méthylheptane



2. 3,7-dichloro-5-isopropyldecane



3. 2,3,5-triméthylheptane

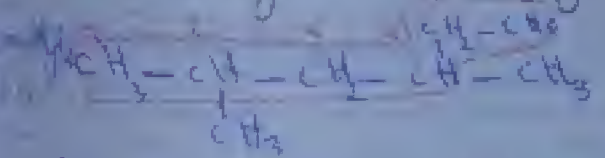


4. 4-éthyl-2-méthylhexane



Exercice 4

1. 4-éthyl-2-méthylpentane



6C → hex  
5C → ac

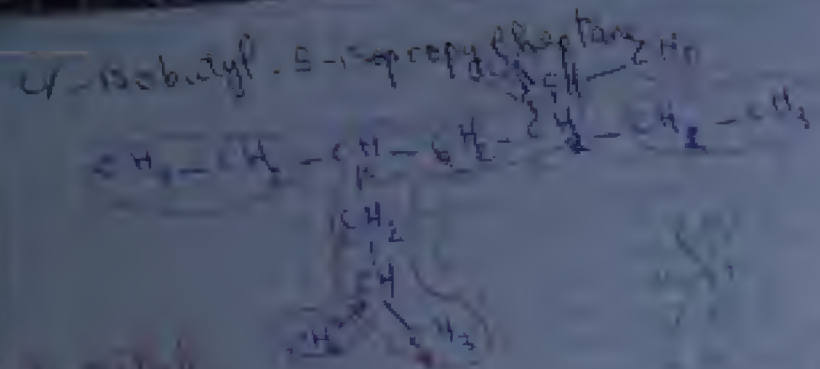
2,4-diméthylhexane

2. 5-éthyl-3-méthylheptane

3-éthyl-5-méthylheptane



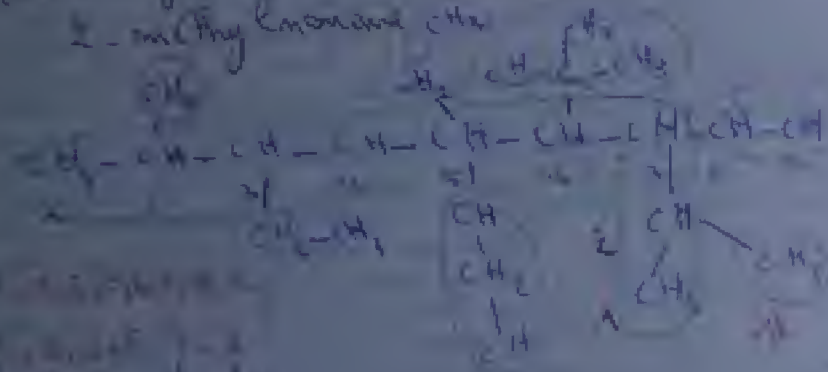




2-methyl  
3-methyl  
4-methyl

3,5-diethyl-2,7-dimethylheptane

4-(sec-butyl)-6-(tert-butyl)-3,5-diethyl-2-isopropyl-2-methylnonane



2-isopropyl

3-ethyl

4-methyl

5-methyl

6-tert-butyl

7-ethyl

8-ethyl

9-methyl

10-methyl

11-methyl

12-methyl

13-methyl

14-methyl

15-methyl

16-methyl

17-methyl

18-methyl

19-methyl

20-methyl

21-methyl

22-methyl

23-methyl

24-methyl

25-methyl

26-methyl

27-methyl

28-methyl

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31-methyl

32-methyl

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83-methyl

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91-methyl

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93-methyl

94-methyl

95-methyl

96-methyl

97-methyl

98-methyl

99-methyl

100-methyl

101-methyl

102-methyl

103-methyl

104-methyl

105-methyl

106-methyl

107-methyl

108-methyl

109-methyl

110-methyl

111-methyl

112-methyl

113-methyl

114-methyl

115-methyl

116-methyl

117-methyl

118-methyl

119-methyl

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151-methyl

152-methyl

153-methyl

154-methyl

155-methyl

156-methyl

157-methyl

158-methyl

159-methyl

160-methyl

161-methyl

162-methyl

163-methyl

164-methyl

165-methyl

166-methyl

167-methyl

168-methyl

169-methyl

170-methyl

171-methyl

172-methyl

173-methyl

174-methyl

175-methyl

176-methyl

177-methyl

178-methyl

179-methyl

180-methyl

181-methyl

182-methyl

183-methyl

184-methyl

185-methyl

186-methyl

187-methyl

188-methyl

189-methyl

190-methyl

191-methyl

192-methyl

193-methyl

194-methyl

195-methyl

196-methyl

197-methyl

198-methyl

199-methyl

200-methyl

201-methyl

202-methyl

203-methyl

204-methyl

205-methyl

206-methyl

207-methyl

208-methyl

209-methyl

210-methyl

211-methyl

212-methyl

213-methyl

214-methyl

215-methyl

216-methyl

217-methyl

218-methyl

219-methyl

220-methyl

221-methyl

222-methyl

223-methyl

224-methyl

225-methyl

226-methyl

227-methyl

228-methyl

229-methyl

230-methyl

231-methyl

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236-methyl

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246-methyl

247-methyl

248-methyl

249-methyl

250-methyl

251-methyl

252-methyl

253-methyl

254-methyl

255-methyl

256-methyl

257-methyl

258-methyl

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260-methyl

261-methyl

262-methyl

263-methyl

264-methyl

265-methyl

266-methyl

267-methyl

268-methyl

269-methyl

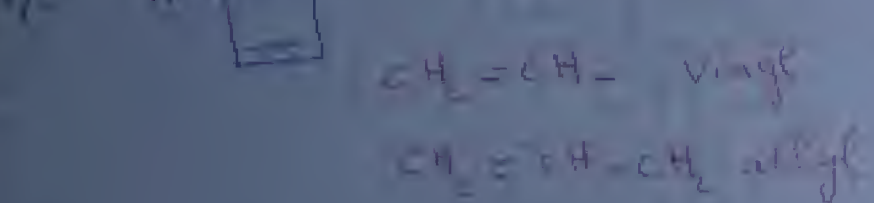
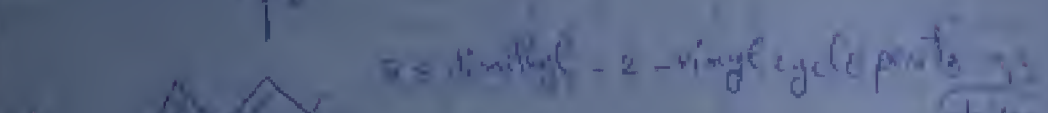
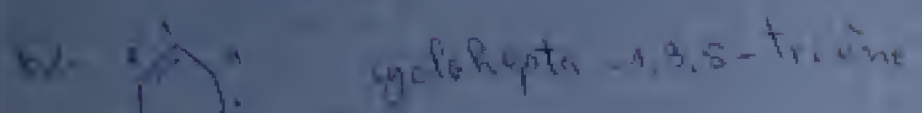
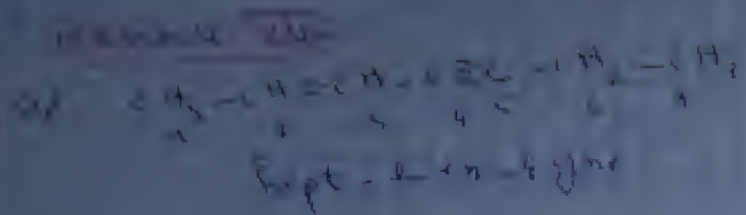
270-methyl

271-methyl

272-methyl

273-methyl

274-methyl



Exercises 2

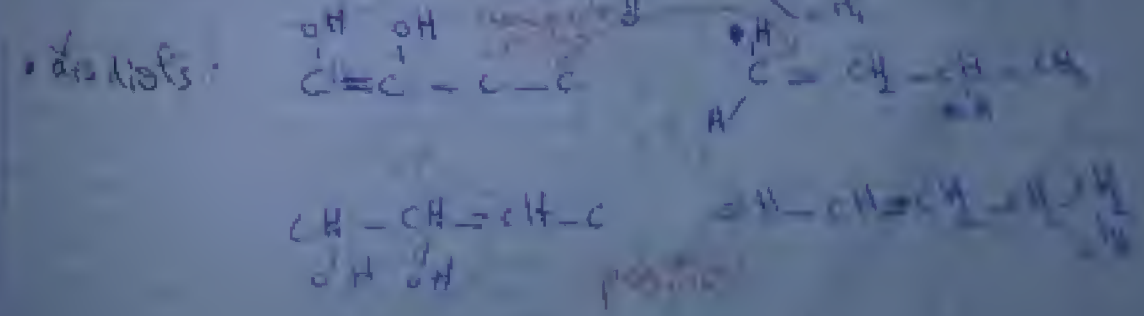
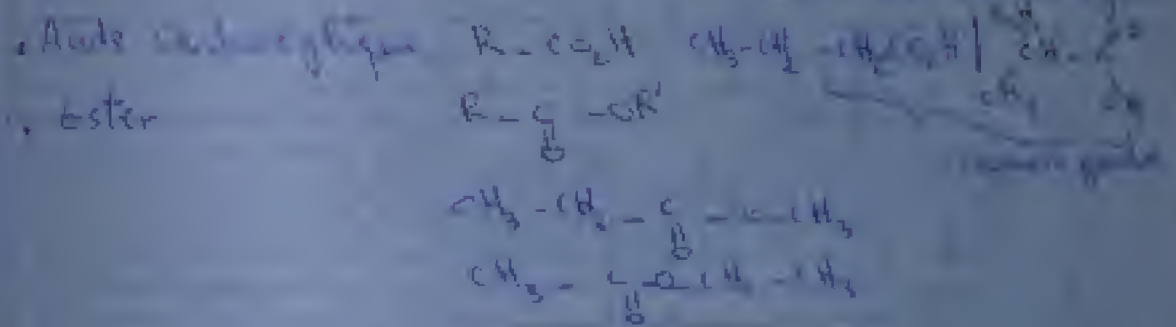
$\text{C}_n\text{H}_y\text{N}_x\text{O}_z$   
 $\text{DI} = n - \frac{1}{2}y + \frac{1}{2}x + 1$

$n = \dots$   
 $y = \dots$  = hydrogen atoms

Exercise 1:  
 1/  $\text{C}_5\text{H}_8\text{Cl}_2\text{O}$   $\text{DI} = 5 - \frac{1}{2}(8) + 1 = 1$   
 = 1 double bond

2/  $\text{C}_7\text{H}_9\text{N}$   $\text{DI} = 7 - \frac{1}{2}(9) + \frac{1}{2}(1) + 1 = 2$   
 $\Rightarrow$  2 double bonds

Exercise 2:  
 $\text{C}_6\text{H}_8\text{O}$   $\text{DI} = 6 - \frac{1}{2}(8) + 1 = 1$   
 $\Rightarrow$  1 double bond





Travaux Dirigés de Chimie Organique  
Série n° 2

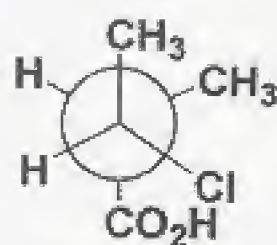
I ) Donner le degré d'insaturation des composés suivants :

- 1)  $C_3H_6Cl_2O$
- 2)  $C_3H_7N$

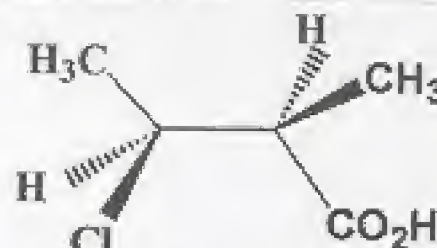
II ) Déterminer les structures des isomères de formule brute :  $C_4H_8O_2$ .

Donner 2 isomères de position, 2 isomères de fonction ainsi que 2 isomères de chaîne.

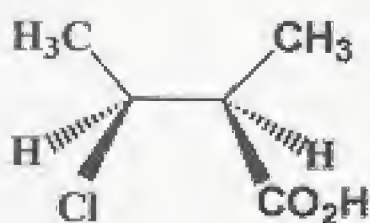
III ) Préciser les relations stéréochimiques liant les représentations suivantes :



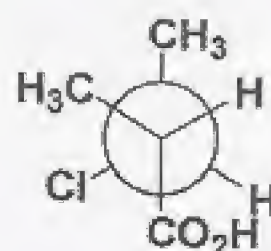
a)



b)



c)



d)

IV ) Donner, en projective et en Newman, les différentes conformations du 1,2-dichloroéthane.

Indiquer la conformation la plus stable ainsi que la moins stable.

V) Représenter, en perspective et en projection de Newman ( selon la liaison :  $C_2 - C_3$  ), la conformation la plus stable du : 3 - chlorobutan - 2 - ol .

VI) Donner, en perspective et en projection de Newman, le conformère le plus stable du :

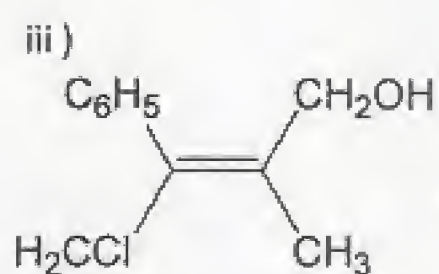
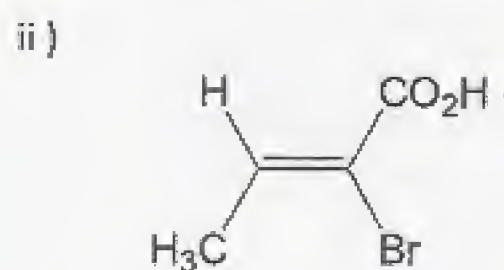
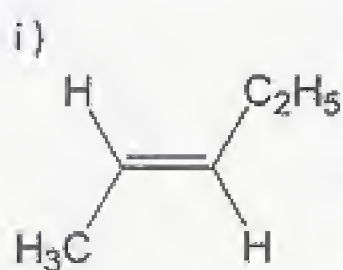
- a) 3 - méthylcyclohexanol  
 b) 1 - éthyl - 2 - méthylcyclohexane  
 c) 1 - éthyl - 4 - tertibutylcyclohexane

VII ) Au sein de chacun des groupes suivants , classer les substituants par ordre de priorité décroissante, selon les règles de Cahn, Ingold et Prélog :

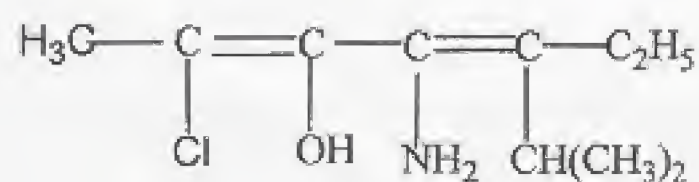
- a) - OH ; - CH<sub>3</sub> ; - F ; - CO<sub>2</sub>H                      b) - CO(CH<sub>3</sub>) ; - CO(NH<sub>2</sub>) ; - C<sub>6</sub>H<sub>5</sub> ; - Br  
 c) - CH<sub>2</sub> - NH<sub>2</sub> ; - CN ; - CH<sub>2</sub> - Cl ; - C(CH<sub>3</sub>)<sub>3</sub>  
 d) - NH<sub>2</sub> ; - CH<sub>3</sub> ; - CH<sub>2</sub>- OH ; - C<sub>2</sub>H<sub>5</sub>

VIII ) – En utilisant la nomenclature Z et E :

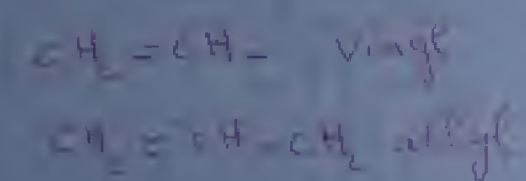
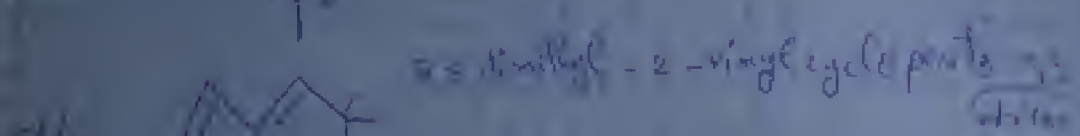
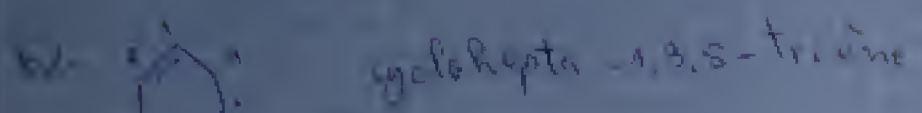
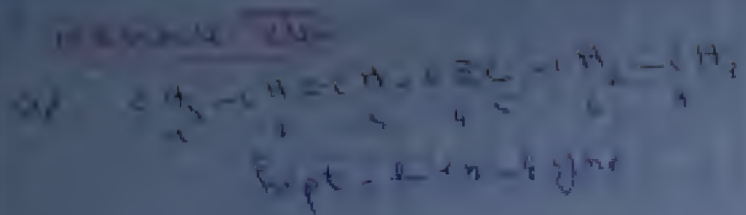
a ) nommer les molécules suivantes:



b ) Donner tous les isomères du composé suivant :







Exercice 2

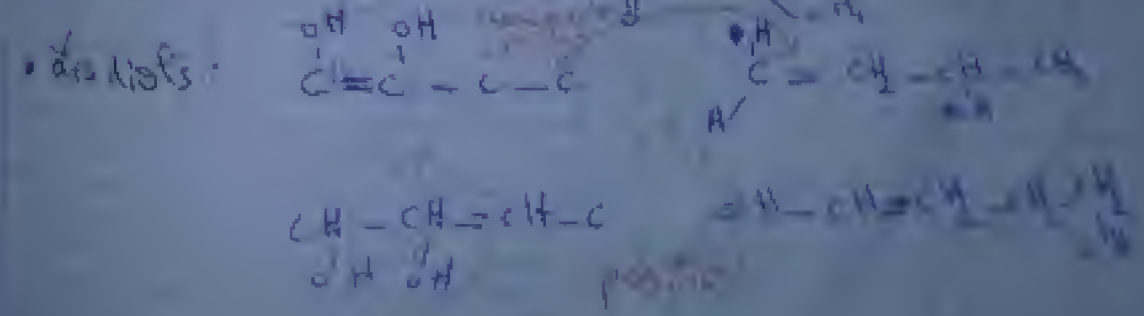
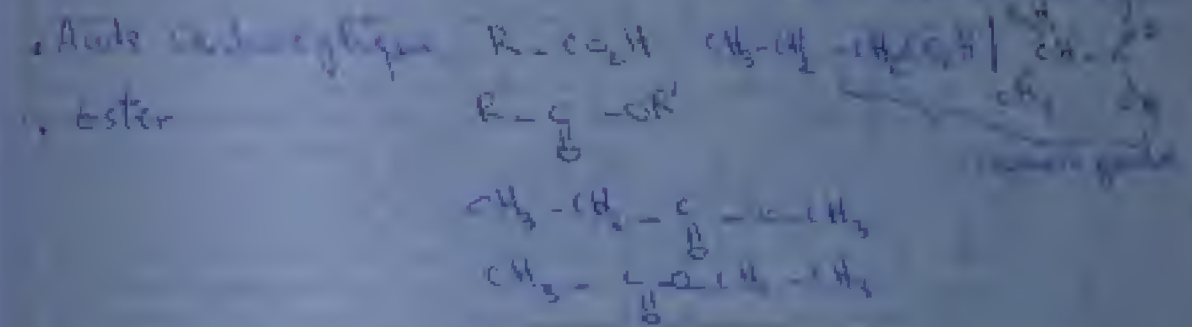
$\text{C}_n\text{H}_y\text{N}_x\text{O}_z$   
 $\text{DI} = n - \frac{1}{2}y + \frac{1}{2}x + 1$

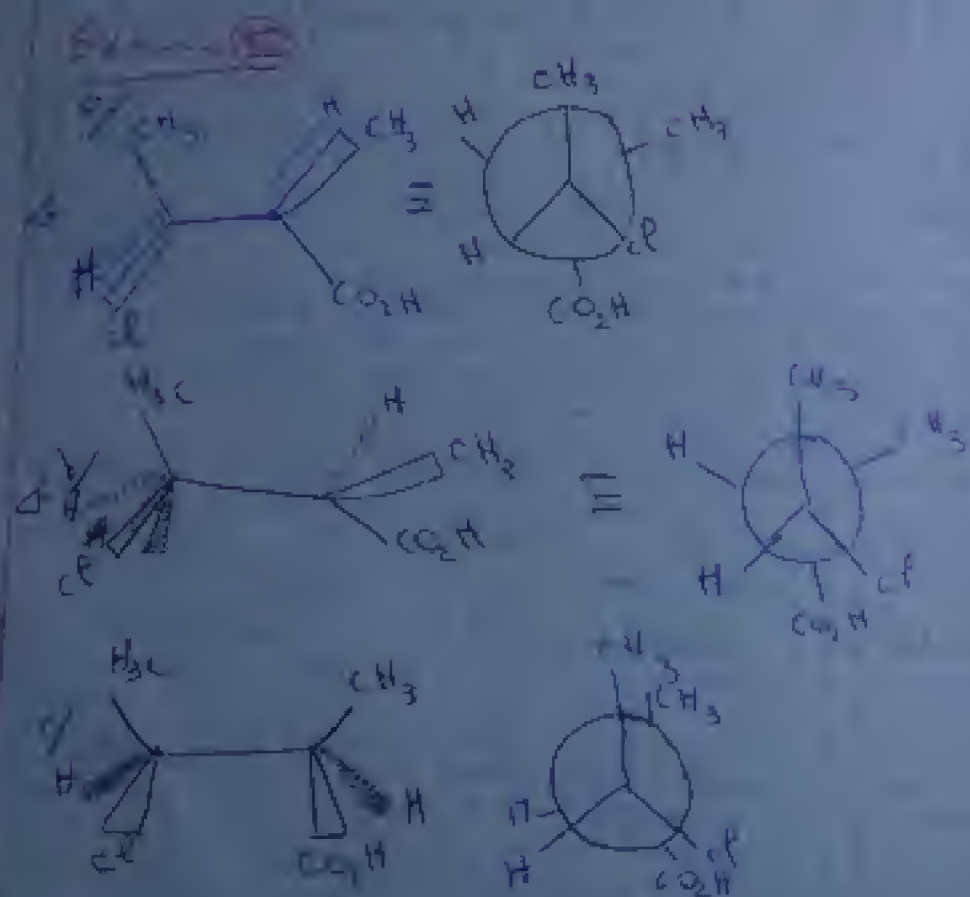
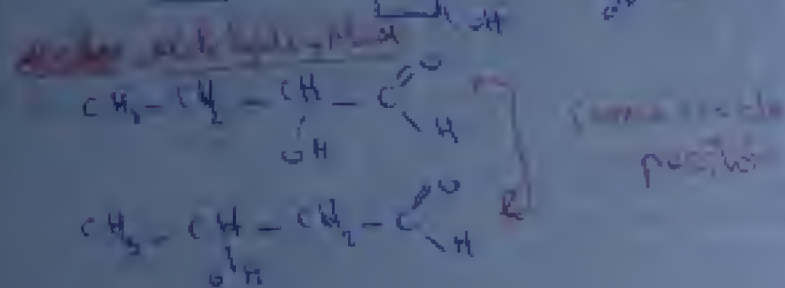
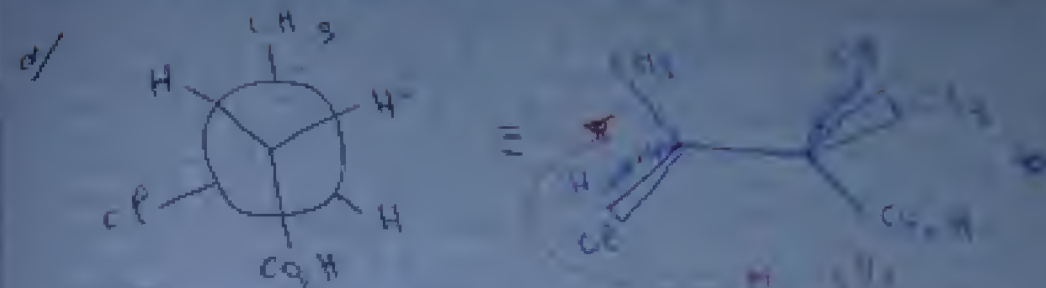
$y = 2n + 2 - 2x$  = hydrogène saturé  
 $n = 5$

Exercice 1  
 1/  $\text{C}_5\text{H}_8\text{Cl}_2\text{O}$   $\text{DI} = 5 - \frac{1}{2}(8) + 1 = 1$   
 = 1 double liaison

2/  $\text{C}_5\text{H}_7\text{N}$   $\text{DI} = 5 - \frac{1}{2}(7) + \frac{1}{2}(1) = 1$   
 $\Rightarrow$  1 cycle

Exercice 3  
 $\text{C}_6\text{H}_8\text{O}$   $\text{DI} = 6 - \frac{1}{2}(8) + 1 = 1$   
 $\Rightarrow$  1 double liaison

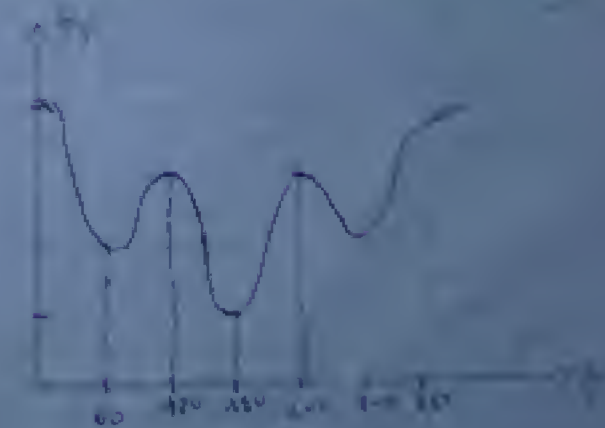
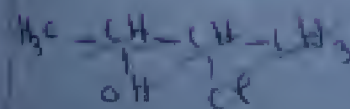
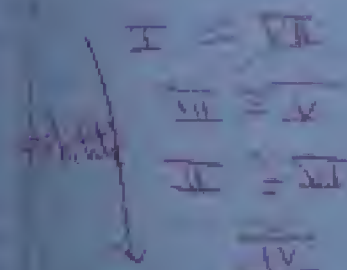
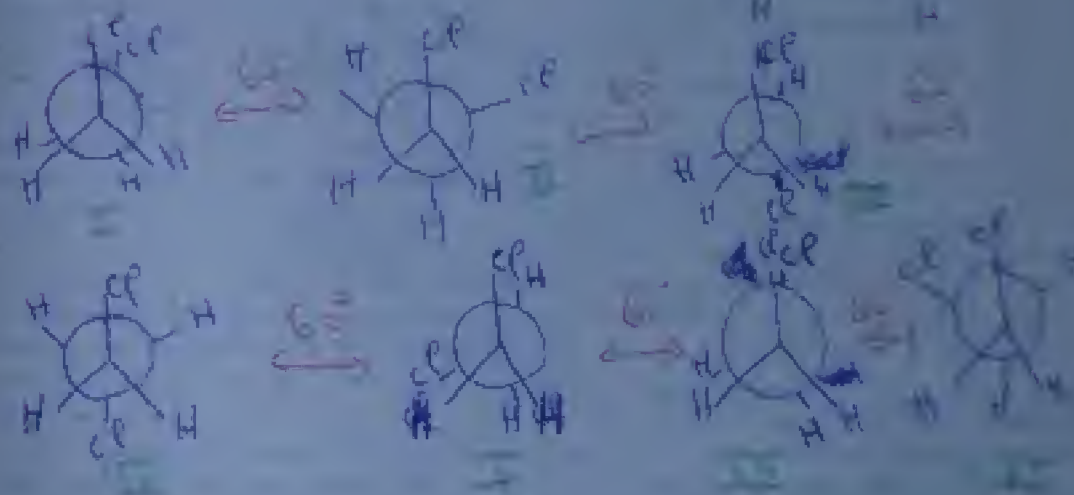


 $a = b$  conformable with  $\mathcal{D}$ 

$a = b = d$  = identiques  
= complément

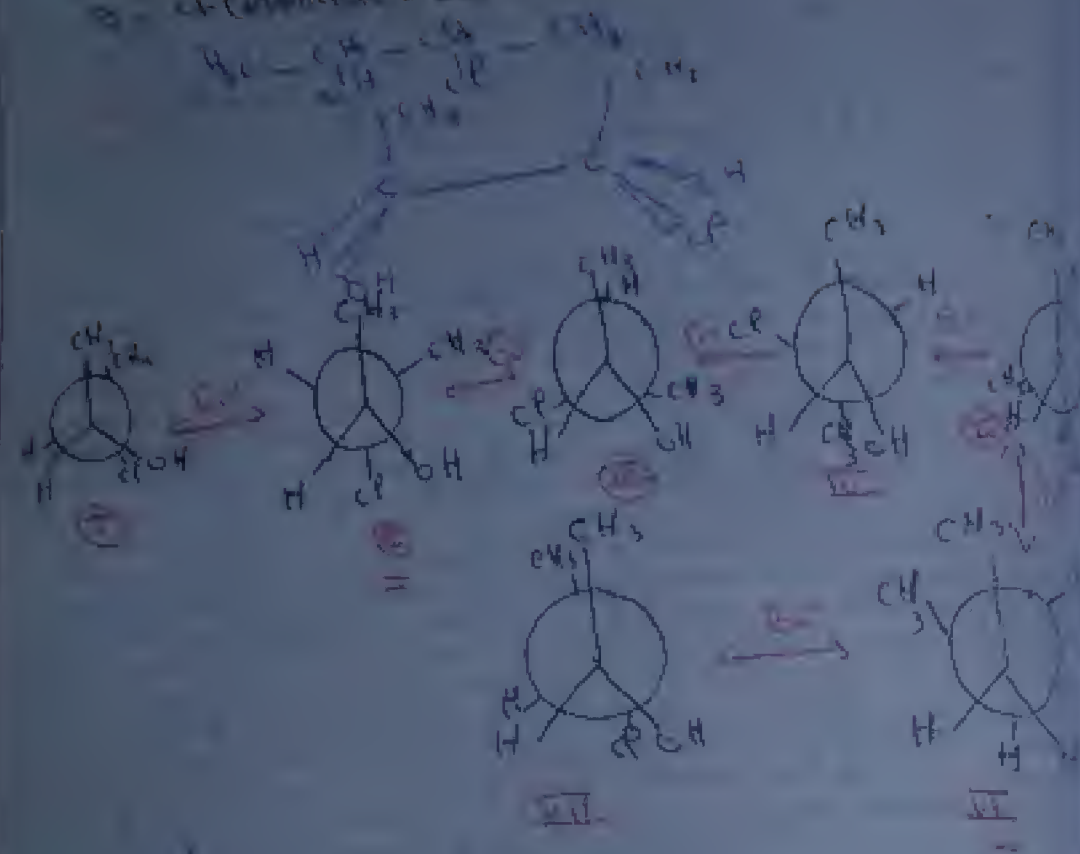
Figure 1

1, 2 - dictators then

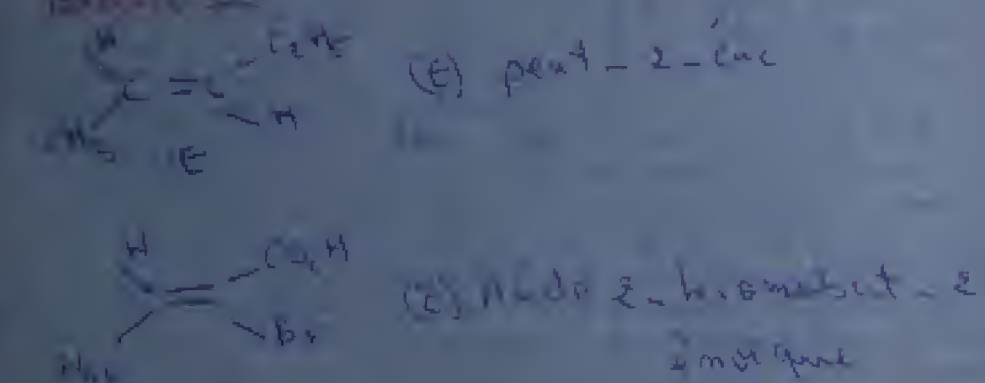




Exercice 1



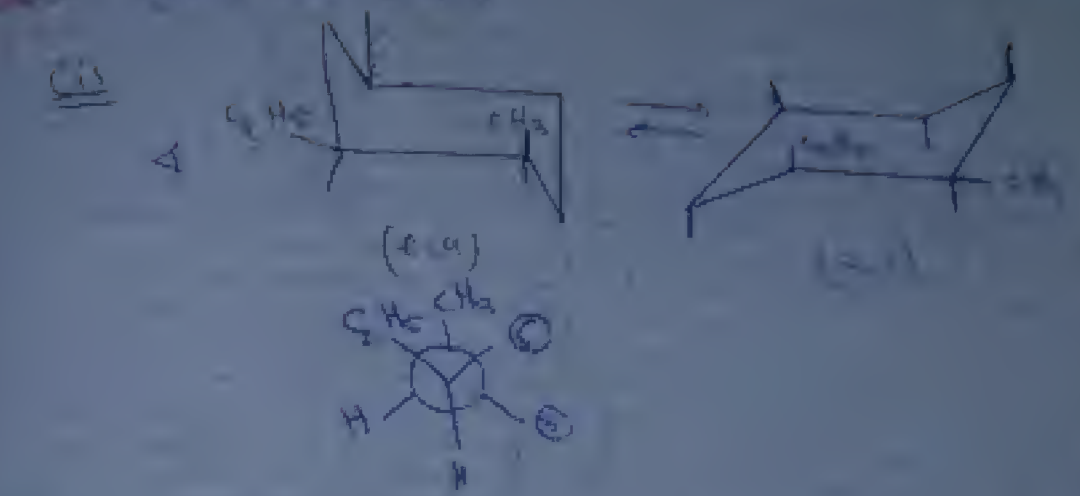
Exercice 2



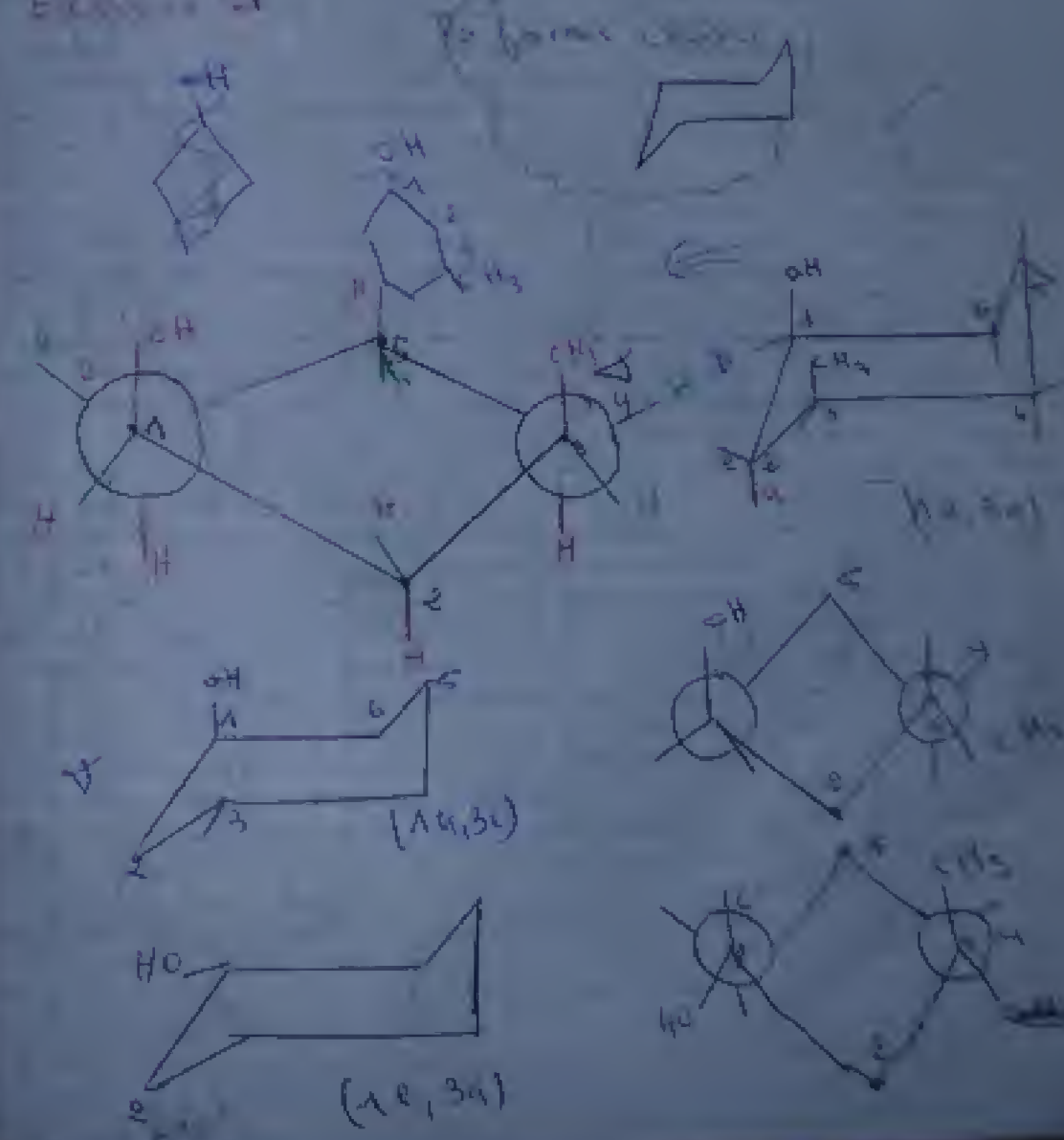
Exercice 3

2-éthyl-2-méthylcyclohexane  
 Composé le composé possible (cis ou trans)  
 Réponse:  
 Le cis est le trans

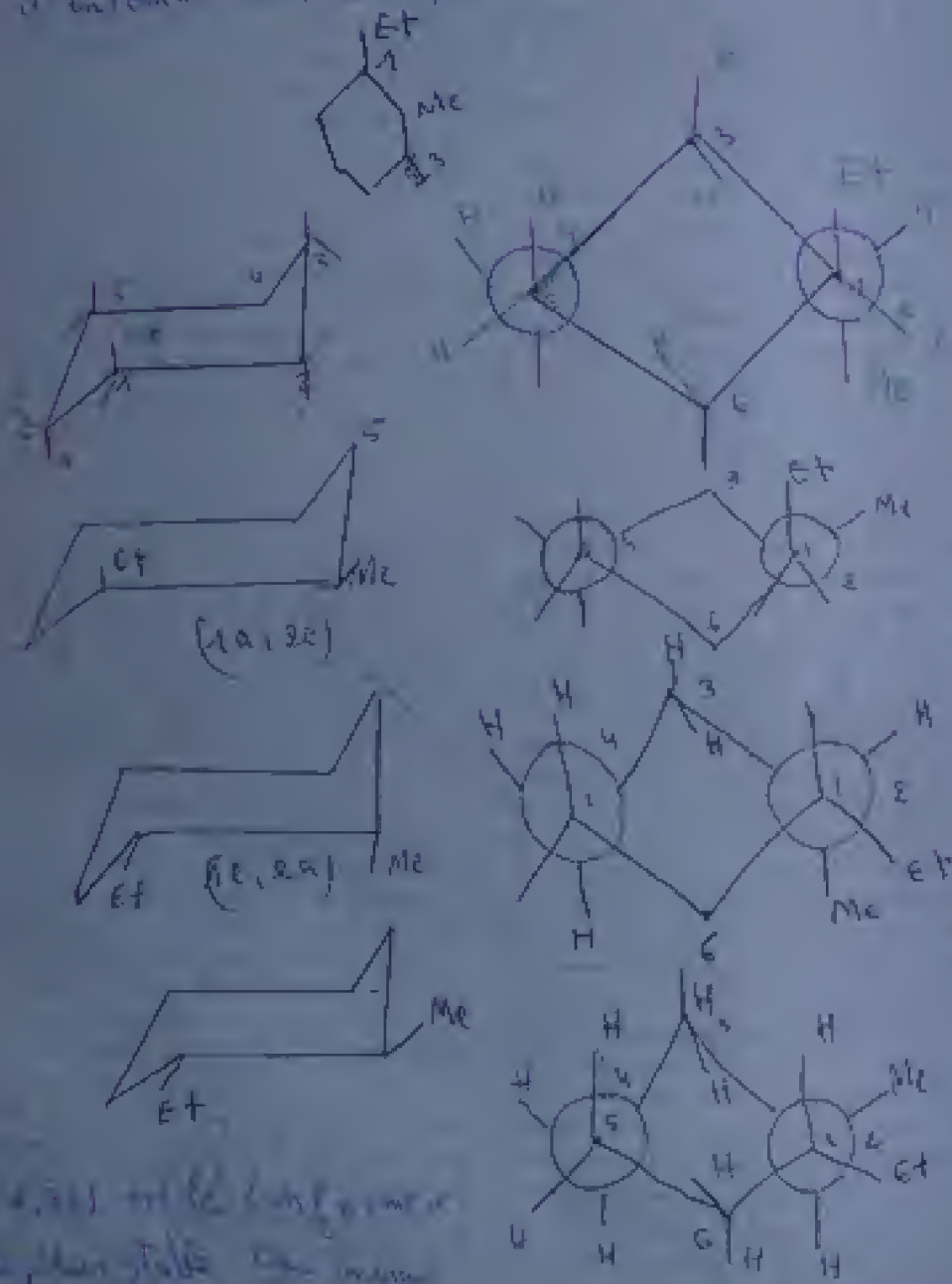
Exercice 4



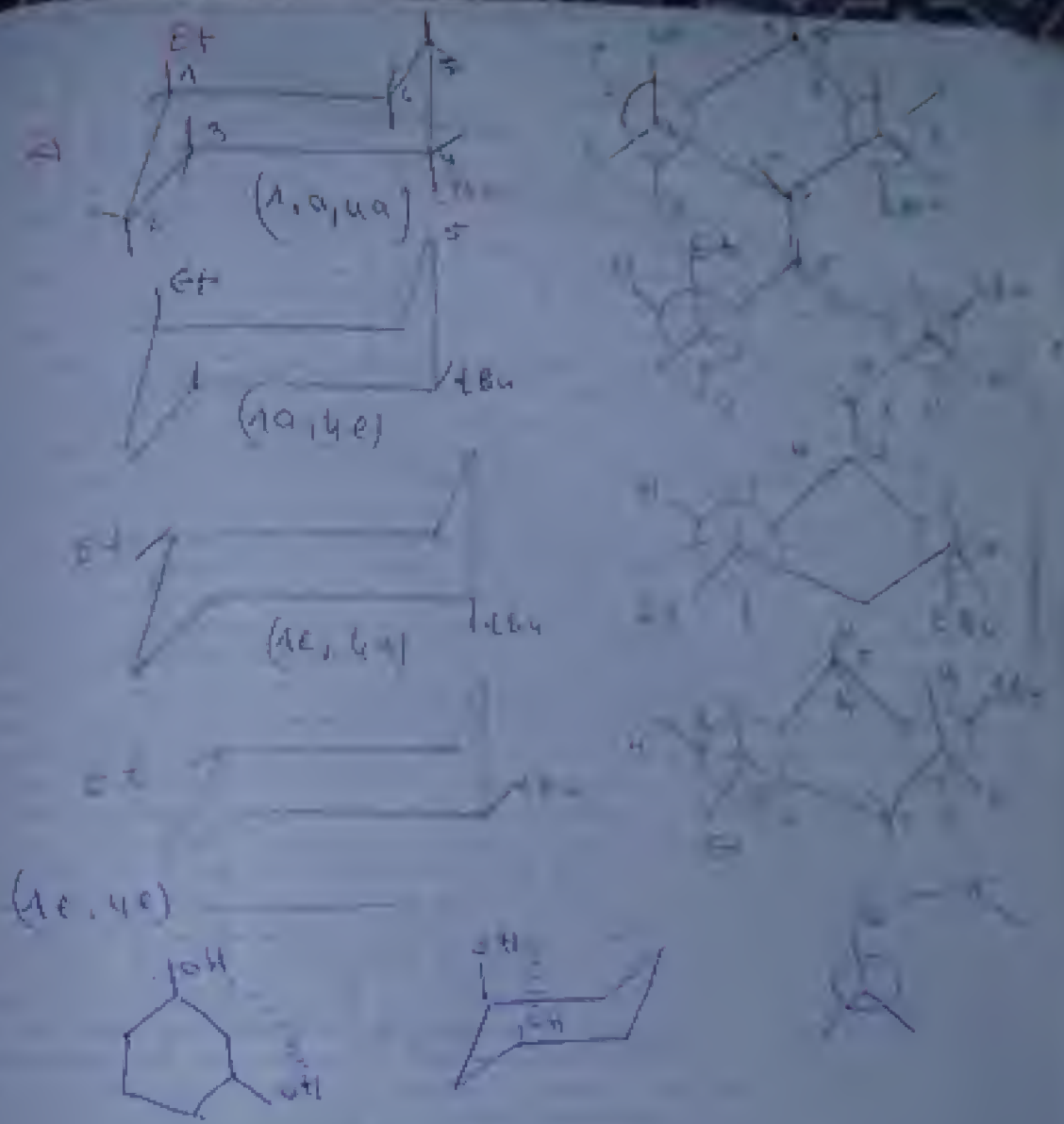
Exercice 5



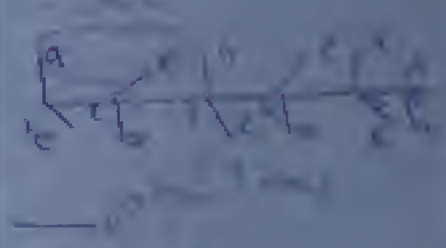
(1u, 2e) est la conformation la plus stable car elle est d'encombrement stérique



La 1,3-diméthylcyclohexane est la conformation la plus stable car elle est d'encombrement stérique

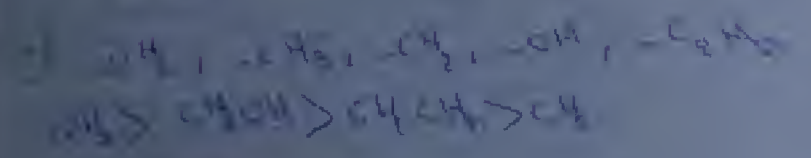
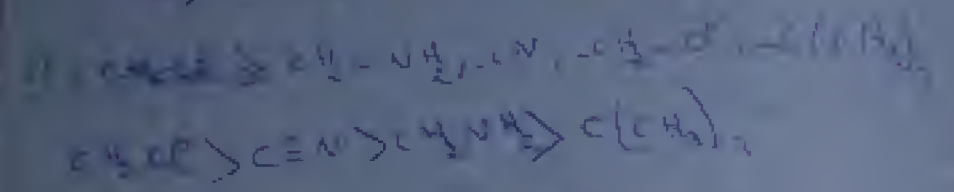
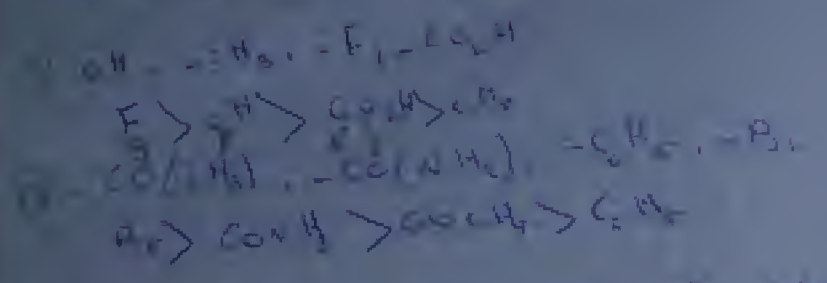


	Cas 1,2	Cas 1,3
1,2	1a, 2a 2e, 2a	1a, 2a 1e, 2e
1,3	1a, 3a 1e, 3e	1a, 3e 1e, 3e
1,4	1a, 4e 1e, 4a	1a, 4a 1e, 4e

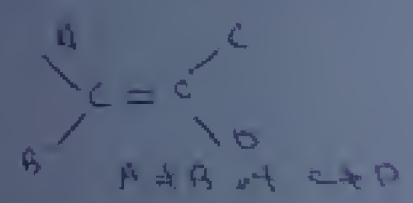




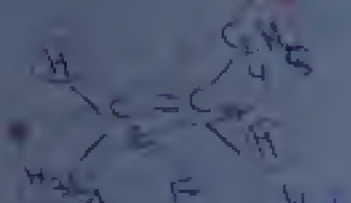
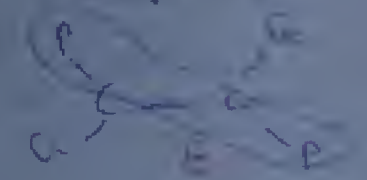
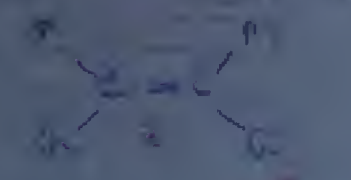
Ex 10.1



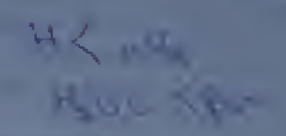
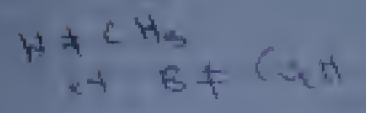
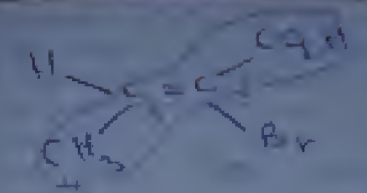
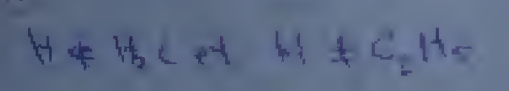
Ex 10.2



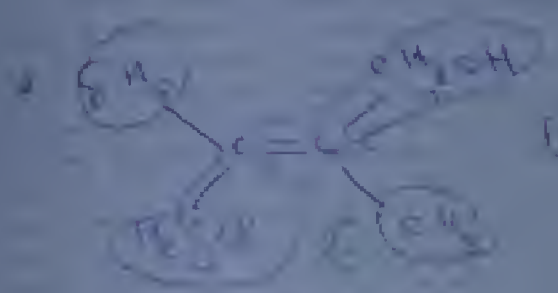
1. E/Z  
 2. R/S  
 3. CIP priority



(E) pent 2-ene



Priority assignment



(E)-chloro-2-methyl-3-phenylbut 2-ene

